Trend Study 16A-11-02

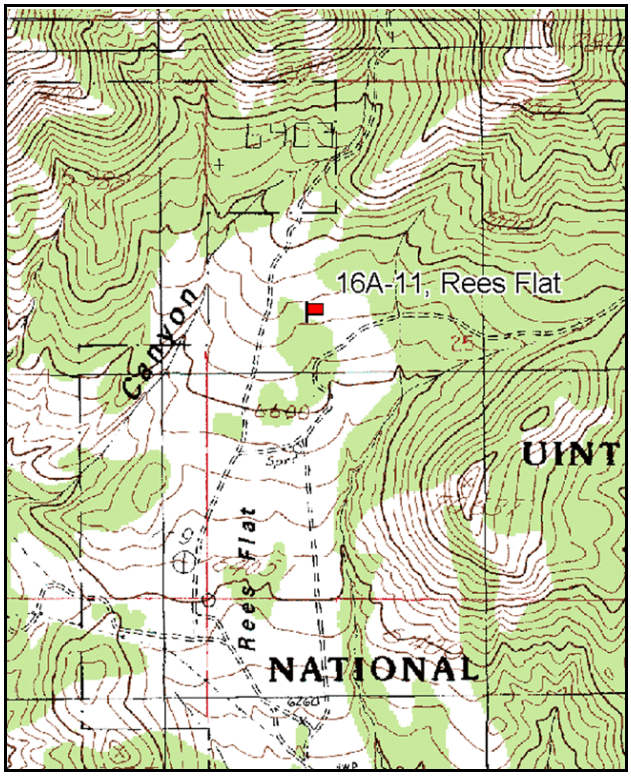
Study site name: Rees Flat . Vegetation type: Mixed Oak-Sage .

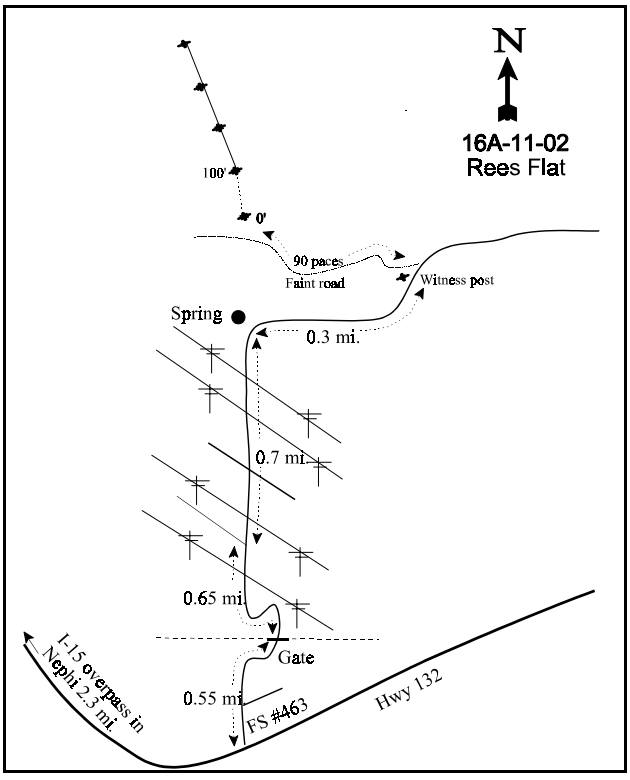
Compass bearing: frequency baseline 344 degrees magnetic (lines 2-4 @ 333°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 5 on 5ft.

LOCATION DESCRIPTION

Beginning at the overpass where Highway 132 crosses beneath I-15 in Nephi, take Highway 132 east for 2.3 miles. Turn north onto Forest Service Road #463 and go 0.2 miles to a fork in the road. Stay left and go another 0.35 miles to a gate. From the gate, go 0.65 miles to another fork. Stay right on the main road for 0.7 miles passing through a 4-way intersection beneath the powerlines until you come to a spring on the left. Continue 0.3 miles farther along to a 3-foot tall witness post 6 paces northwest of the road near some oak brush. Stop here and walk 90 paces west on a faint road. The 0-foot baseline stake is 9 paces north of the faint road. It is a 12 inch high red post marked by browse tag #3956.





Map Name: Nephi

Diagrammatic Sketch

Township 12S , Range 1E , Section 25

GPS: NAD 27, UTM 12S 4399151 N 433453 E

DISCUSSION

Rees Flat - Trend Study No. 16A-11

The Rees Flat study is located on a burned and seeded, mixed Gambel oak and mountain big sagebrush type. The site has a gentle (10%) south aspect and an elevation of approximately 6,500 feet. This area is considered a rather high elevation for deer winter range, but elk tend to use it fairly consistently. A moderate number of deer and elk pellet groups, as well as two deer antler drops, were encountered in 1983 when the site was established. In 1997, pellet group quadrat frequency was moderately high for elk and deer at 38% and 26% respectively. Cattle and horses also graze the area in the summer. A pellet group transect read along the study baseline in 2002 estimated 56 deer and 27 elk days use/acre (137 ddu/ha and 66 edu/ha). Cattle use was estimated at 9 days use/acre. Nearly all of the deer pellet groups appear to have been from winter use, while about one-half of the elk pellet groups were from spring use.

Soil on the site is fairly deep with an effective rooting depth estimated at just over 15 inches. Soil texture is a clay loam with a moderately acidic pH of 5.9. The extent of rock in the profile varies along the baseline with the highest amount of rock near the surface along the original 100 feet of the baseline, with noticeably less further down the extended baseline. Litter buildup since the fire has been minimal except within the oak clones. Vegetation cover is much thinner in the openings and consists mostly of low growing bulbous bluegrass. There is little exposed bare ground and erosion is minimal due to the gentle slope. An erosion condition classification assessment was determined as stable in 2002.

The principal browse species are Gambel oak, mountain big sagebrush, and antelope bitterbrush. Gambel oak provided 40% of the browse cover in 1997 with an estimated density of 1,740 stems/acre. It occurs in scattered clones of various sizes. The average height of oak in 1997 was just over 7 feet. Density was similar between 1983 and 1989, but much lower in 1997 and 2002 due to the lengthened baseline and larger sample size. Utilization of the oak has been light, vigor good, and decadence low. Density of oak was estimated at 2,480 stems/acre in 2002. Many of the oak sampled in 2002 displayed poor vigor due to a late spring frost.

The larger sample used in 1997 also picked up more mountain big sagebrush which increased from a density of 499 plants/acre in 1983 along the original baseline to 1,900 plants/acre along the lengthened baseline. Age class composition in 1997 indicated an expanding population. In fact, the sagebrush population had increased by 45% to 3,460 plants/acre in 2002. Utilization continues to be mostly light, vigor good, with low numbers of decadent plants. Mature plants are vigorous with good annual leader growth averaging nearly 3 inches in 2002. Recruitment has been excellent with large numbers of seedlings and young sampled in 1997 and 2002, suggesting further increases in density in the future.

Antelope bitterbrush occurs in small numbers and is more heavily utilized. Density was estimated at 420 plants/acre in 2002. Mature plants average just over 2 feet in height with a crown diameter of 6 feet. Utilization was mostly moderate from 1983-1997, but very heavy in 2002. Annual leader growth of bitterbrush was poor in 2002 averaging only 1.4 inches. Vigor has remained normal and no decadent plants have been sampled during any reading. With this in mind, reproduction appears adequate to maintain a slightly increasing population. The only other common shrub found on the site is broom snakeweed which had a density of 1,500 plants/acre in 1997, increasing to 2,600 by 2002. The population has remained relatively stable since 1983.

Grasses provide a relatively uniform and moderately dense cover within openings, but are rare within the oak clones. Smooth brome is the only species that is shade tolerant. In 1983, livestock grazing apparently depressed the vigor, height, and production of almost all grass species. Grasses are abundant, but composition is dominated by the less desirable bulbous bluegrass which provided 72% of the total grass cover

in 1997, increasing to 77% in 2002. Smooth brome and crested wheatgrass are also fairly abundant. Cheatgrass was found in relatively small numbers in 1997 (6% of grass cover), but due to drought conditions, it was not sampled in 2002. Forbs are diverse yet combined to produce less than 2% total cover in 1997 declining to less than 1% in 2002. The most common species include longleaf phlox and milkvetch.

1983 APPARENT TREND ASSESSMENT

This area is still recovering from fire and long term trend is difficult to determine. Soil trend appears stable, but rapid improvement is being handicapped by intense livestock use. From a vegetative standpoint, Gambel oak is currently at an optimum level of availability and abundance. Openings within the oak contain very little browse except for an increasing population of broom snakeweed. Grasses are abundant but have rather poor vigor. Forb composition and density are at less then optimum levels.

1989 TREND ASSESSMENT

There was some increase in the percentage of vegetative basal cover and rock cover, but an abundant amount (23%) of bare soil still remains. Overall, erosion on the site is minimal and trend appears stable. The population of the dominant Gambel oak is relatively stable. Density of mature plants has declined possibly due to observer differences in classification. There is an abundance of young sprouts. The vigorous and moderately hedged bitterbrush exhibits an improving trend. Twenty-two percent of the population are young plants and biotic potential (# of seedlings) is also good at 22%. Although the mountain big sagebrush appears vigorous and productive, the density of mature plants declined to only 100 per acre. Broom snakeweed declined in density, but there are still 1,600 plants/acre. However, they only contribute 5% of the browse cover. Seeded grass species, namely crested wheatgrass and smooth brome, are found on the site, but bulbous bluegrass dominates the site. Bulbous bluegrass has increased significantly since 1983. Nested frequency of crested wheatgrass shows a decline. Some of the increase in frequency of bulbous bluegrass appears to be due to an identification problem between Sandberg bluegrass and bulbous bluegrass in 1983. Forb composition is similar between years, however they remain of limited forage value.

TREND ASSESSMENT
soil - stable (3)
browse - stable overall, slightly down for sagebrush (3)
herbaceous understory - stable (3)

1997 TREND ASSESSMENT

Trend for soil is up slightly. Percent bare ground declined from 23% to 8%, but litter cover declined as well. Some of these changes are due to the larger sample used which sampled less oak and more sagebrush openings. The browse trend is up. More sagebrush was picked up in the larger sample, and 72% of the sagebrush encountered consisted of young plants. This would demonstrate an expanding population. Bitterbrush and Gambel oak appear to have stable populations. Trend for the herbaceous understory is up slightly, but still dominated by the low value increaser bulbous bluegrass. Crested wheatgrass continued to decline in its sum of nested frequency value (not shade tolerant) while smooth brome (shade tolerant) continued to increase.

TREND ASSESSMENT
soil - up slightly (4)
browse - up for sagebrush (5)
herbaceous understory - up slightly (4)

2002 TREND ASSESSMENT

Trend for soil is stable. There was a small increase in cover of bare ground but protective ground cover is abundant and there is no significant erosion occurring. Trend for browse is up. Mountain big sagebrush is now the most abundant shrub on the site. It has increased 45% in density from 1,900 plants/acre in 1997 to 3,560 plants/acre in 2002. Use is mostly light, vigor good, decadence low, and recruitment excellent. It appears that the heavy livestock grazing in this area has benefitted shrubs. Bitterbrush numbers only about 400 plants/acre but it contributes 21% of the total browse cover. These plants average just over 2 feet in height but have a large crown diameter which averages 6 feet. They displayed heavy use in 2002, but vigor continues to be normal and no decadent plants were sampled. Recruitment also remains good and the population appears to be slowly expanding. Gambel oak appears to be relatively stable with a similar cover and strip frequency compared to 1997. Trend for the herbaceous understory is stable but still dominated by the low value perennial, bulbous bluegrass. Crested wheatgrass declined significantly in nested frequency while smooth brome increased significantly. Nested frequency of bulbous bluegrass remained stable. Perennial forbs continue to be rare.

TREND ASSESSMENT
soil - stable (3)
browse - up (5)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 16A, Study no: 11

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	$_{c}$159	$_{b}$117	$_{b}$94	$_{a}$33	62	44	38	14	2.14	.42
G	Agropyron spicatum	$_{b}$24	$_{ab}$11	$_{a}$-	$_{a}$4	10	5	-	1	-	.03
G	Bromus inermis	$_{a}$88	$_{a}$118	$_{b}$170	$_{c}$245	32	40	55	81	5.09	8.34
G	Bromus tectorum (a)	-	-	$_{b}$48	$_{a}$-	-	-	17	-	2.26	-
G	Dactylis glomerata	6	2	-	-	2	1	-	-	-	-
G	Poa bulbosa	$_{a}$3	$_{b}$282	$_{c}$352	$_{c}$335	1	85	93	89	26.80	31.76
G	Poa fendleriana	-	3	-	-	-	1	-	-	-	-
G	Poa pratensis	14	14	-	3	4	5	-	1	-	.38
G	Poa secunda	$_{b}$290	$_{a}$18	$_{a}$25	$_{a}$29	88	6	11	13	.37	.51
Total for Annual Grasses		0	0	48	0	0	0	17	0	2.26	0
Total for Perennial Grasses		584	565	641	649	199	187	197	199	34.42	41.44
Total for Grasses		584	565	689	649	199	187	214	199	36.69	41.44
F	Agoseris glauca	3	-	7	1	1	-	4	1	.19	.03
F	Artemisia ludoviciana	4	3	-	-	2	1	-	-	-	-
F	Astragalus beckwithii	$_{a}$-	$_{a}$-	$_{a}$-	$_{b}$14	-	-	-	7	-	.16
F	Aster chilensis	-	10	-	-	-	4	-	-	-	-
F	Astragalus convallarius	-	-	2	-	-	-	1	-	.03	-
F	Astragalus spp.	-	-	15	-	-	-	7	-	.43	-
F	Calochortus nuttallii	3	-	7	-	2	-	4	-	.02	-
F	Cirsium spp.	5	6	4	5	3	4	2	3	.04	.18

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Collomia spp. (a)	-	-	1	-	-	-	1	-	.00	-
F	Comandra pallida	$_{bc}$23	$_{c}$29	$_{ab}$10	$_{a}$5	10	11	4	2	.48	.03
F	Cymopterus longipes	$_{b}$10	$_{a}$-	$_{ab}$5	$_{ab}$6	7	-	3	3	.04	.04
F	Epilobium brachycarpum (a)	-	-	$_{b}$19	$_{a}$3	-	-	8	1	.04	.00
F	Erigeron divergens	-	-	2	-	-	-	1	-	.15	-
F	Lathyrus brachycalyx	2	-	-	-	1	-	-	-	-	-
F	Lactuca serriola	-	-	1	-	-	-	1	-	.00	-
F	Lomatium spp.	-	3	9	-	-	1	5	-	.05	-
F	Machaeranthera canescens	-	9	2	-	-	4	1	-	.00	-
F	Phlox longifolia	16	15	26	11	7	6	11	5	.05	.40
F	Polygonum douglasii (a)	-	-	-	3	-	-	-	1	-	.00
F	Solidago sparsiflora	2	-	-	-	2	-	-	-	-	-
F	Stellaria spp.	5	-	-	-	3	-	-	-	-	-
F	Tragopogon dubius	$_{b}$14	$_{ab}$6	$_{ab}$6	$_{a}$3	9	3	3	1	.01	.00
F	Unknown forb-annual (a)	-	-	2	-	-	-	1	-	.00	-
F	Viguiera multiflora	$_{b}$9	$_{a}$-	$_{a}$-	$_{a}$-	5	-	-	-	-	-
F	Zigadenus paniculatus	-	-	3	1	-	-	1	1	.03	.03
Total for Annual Forbs		0	0	22	6	0	0	10	2	0.04	0.00
Total for Perennial Forbs		96	81	99	46	52	34	48	23	1.54	0.89
Total for Forbs		96	81	121	52	52	34	58	25	1.59	0.90

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 16A, Study no: 11

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia tridentata vaseyana	45	55	4.21	9.89
B	Chrysothamnus nauseosus albicaulis	1	1	.15	.03
B	Chrysothamnus viscidiflorus viscidiflorus	0	2	-	-
B	Gutierrezia sarothrae	18	37	.52	1.52
B	Purshia tridentata	7	15	1.54	4.21
B	Quercus gambelii	14	16	4.35	4.57
Total for Browse		85	126	10.79	20.23

CANOPY COVER --
Herd unit 16A, Study no: 11

Species	Percent Cover '97	'02
Quercus gambelii	-	1

Key Browse Annual Leader Growth
Herd unit 16A , Study no: 11

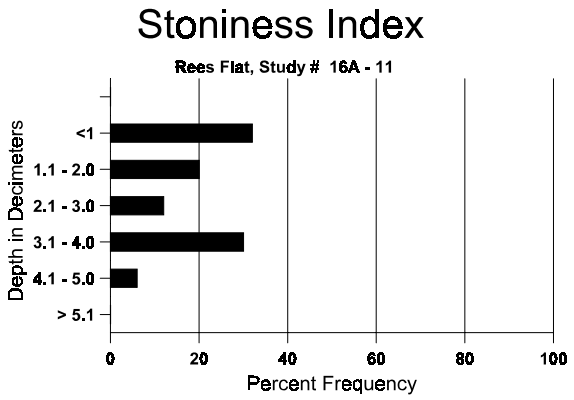
Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	2.6
Purshia tridentata	1.4

BASIC COVER --
Herd unit 16A, Study no: 11

Cover Type	Nested Frequency '97	'02	Average Cover % '83	'89	'97	'02
Vegetation	382	376	.25	8.25	50.06	57.61
Rock	95	72	7.50	7.75	2.80	3.06
Pavement	208	176	3.50	8.25	5.17	2.70
Litter	391	378	54.50	50.00	33.86	38.47
Cryptogams	201	144	.50	3.00	8.60	4.12
Bare Ground	190	189	33.75	22.75	7.52	11.90

SOIL ANALYSIS DATA --
Herd Unit 16A, Study no: 11, Rees Flat

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
15.4	48.0 (17.0)	5.9	40.4	33.1	26.6	2.4	29.8	179.2	.4



PELLET GROUP FREQUENCY --
Herd unit 16A, Study no: 11

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	'02	'02
Rabbit	2	3	-	-
Elk	38	13	348	27 (66)
Deer	26	29	722	56 (137)
Cattle	2	4	113	9 (23)

BROWSE CHARACTERISTICS --
Herd unit 16A, Study no: 11

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	28	-	-	-	-	-	-	-	-	28	-	-	-	560			28
	02	18	-	-	-	-	-	-	-	-	18	-	-	-	360			18
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	68	-	-	-	-	-	-	-	-	68	-	-	-	1360			68
	02	79	2	2	-	-	-	-	-	-	83	-	-	-	1660			83
M	83	12	2	-	-	-	-	-	-	-	14	-	-	-	466	18	26	14
	89	2	-	1	-	-	-	-	-	-	3	-	-	-	100	17	13	3
	97	15	6	3	-	-	-	-	-	-	24	-	-	-	480	24	44	24
	02	45	29	5	-	-	-	-	-	-	79	-	-	-	1580	18	36	79
D	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	-	1	-	-	-	-	-	-	-	-	-	1	-	33			1
	97	2	-	1	-	-	-	-	-	-	-	-	-	3	60			3
	02	9	1	1	-	-	-	-	-	-	1	-	7	3	220			11
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	13%	00%	00%	-60%
'89	17%	17%	17%	+90%
'97	06%	04%	03%	+45%
'02	18%	05%	06%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	499	Dec:	7%
	'89	199		17%
	'97	1900		3%
	'02	3460		6%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus albicaulis																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	1	-	-	-	-	-	-	-	1	-	-	-	20	9	13	1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	37	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	1	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	100%	00%	00%	+ 0%
'02	100%	00%	100%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		0%
'89	0			0%
'97	20			0%
'02	20			100%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	10	28	0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	9	22	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	-
'89	0		-
'97	0		-
'02	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	83	22	-	-	-	-	-	-	-	-	22	-	-	-	733			22
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	19	-	-	-	-	-	-	-	-	19	-	-	-	380			19
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	44	-	-	-	-	-	-	-	-	44	-	-	-	1466			44
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	97	25	-	-	-	-	-	-	-	-	25	-	-	-	500			25
	02	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
M	83	21	-	-	-	-	-	-	-	-	21	-	-	-	700	8	6	21
	89	39	-	-	-	-	-	-	-	-	39	-	-	-	1300	9	7	39
	97	45	-	-	-	-	-	-	-	-	45	-	-	-	900	5	8	45
	02	91	-	-	-	-	-	3	-	-	94	-	-	-	1880	4	7	94
D	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	6	-	-	-	-	-	-	-	-	6	-	-	-	200			6
	97	5	-	-	-	-	-	-	-	-	-	-	-	5	100			5
	02	30	-	-	-	-	-	-	-	-	19	-	-	11	600			30
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-27%
'89	00%	00%	00%	- 6%
'97	00%	00%	07%	+42%
'02	00%	00%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2199	Dec:	2%
	'89	1600		13%
	'97	1500		7%
	'02	2600		23%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	2	-	-	2	-	-	-	66			2
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	1	-	-	-	-	-	-	2	-	-	-	66			2
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	2	1	-	-	-	-	-	-	-	3	-	-	-	60			3
M	83	1	4	-	-	-	-	-	-	-	5	-	-	-	166	16	28	5
	89	-	7	-	-	-	-	-	-	-	7	-	-	-	233	23	39	7
	97	1	6	1	-	-	-	-	-	-	8	-	-	-	160	27	81	8
	02	-	1	17	-	-	-	-	-	-	18	-	-	-	360	27	72	18

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	80%	00%	00%	+44%
'89	78%	11%	00%	-33%
'97	60%	10%	00%	+52%
'02	10%	81%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'83	166		-
	'89	299		-
	'97	200		-
	'02	420		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
S	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	89	18	-	-	11	-	-	2	-	-	31	-	-	-	1033			31
	97	1	-	-	1	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	6	-	-	-	-	-	-	-	-	6	-	-	-	200			6
	89	29	-	-	8	-	-	-	-	-	36	-	-	1	1233			37
	97	33	-	-	-	-	-	-	-	-	33	-	-	-	660			33
	02	5	-	-	-	-	-	-	-	-	3	-	2	-	100			5
M	83	141	-	-	-	-	-	-	-	-	141	-	-	-	4700	46	24	141
	89	27	-	-	13	-	-	21	-	-	59	1	-	1	2033	77	36	61
	97	40	1	-	13	-	-	-	-	-	54	-	-	-	1080	86	76	54
	02	94	-	17	-	-	-	-	-	-	77	-	34	-	2220	62	32	111
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	20	1	-	-	-	-	-	-	-	20	-	-	1	700			21
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	6	-	-	-	-	-	2	-	-	6	-	-	2	160			8
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-19%
'89	.84%	00%	03%	-56%
'97	01%	00%	00%	+30%
'02	00%	14%	31%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	4900	Dec:	0%
	'89	3966		18%
	'97	1740		0%
	'02	2480		6%